IDRC 2025 NICOSIA

8th International Disaster and Risk Conference

8TH INTERNATIONAL DISASTER AND RISK CONFERENCE

AI FOR A SAFER TOMORROW

AI, EMERGING TECH & IMMERSIVE SOLUTIONS FOR DISASTER & EMERGENCY RESPONSE

23-24TH OCTOBER 2025

CYENS CENTRE OF EXCELLENCE
& MUNICIPALITY OF NICOSIA,
NICOSIA, CYPRUS

- Austria
- Brazil
- China
- Cyprus
- Denmark
- France
- Germany
- Greece
- India
- Iran
- Ireland
- Italy
- Japan
- Jordan
- Mexico
- North Macedonia
- South Korea
- Sweden
- Switzerland
- United Kingdom (UK)
- USA

THE CHAIRMAN'S WELCOME

Since 2006, the International Disaster and Risk Conferences (IDRC) have united more than 1,000 participants from around the world, establishing themselves as the leading platform for integrative risk management. By bringing together business leaders, policymakers, practitioners, and scientists, IDRC has consistently fostered innovation and collaboration to address the most pressing global risks.

Held biennially, the conferences feature dynamic sessions, workshops, and exhibitions, shaping international frameworks and advancing themes such as resilience, climate adaptation, and disaster management. Over the years, IDRC has become a trusted arena where knowledge and practice converge.

The 2025 edition in Nicosia marks the first time the conference is held in Cyprus, with a special focus on emerging technologies and their transformative role in disaster resilience and preparedness.

For a first year in Cyprus and with a brand-new theme, the level of global participation has been truly remarkable. I sincerely hope that in the coming years, IDRC will grow into a regional reference point for safety, disaster risk management, and innovative technologies.

Dr. Walter J. Ammann
Honorary Chair, IDRC Nicosia 2025

NICOSIA'S REPRESENTATIVES WELCOME

Nicosia proudly welcomes the 8th International Disaster and Risk Conference (IDRC 2025) — a leading global forum showcasing the strength of collaboration, innovation, and resilience in addressing today's complex challenges.

Under the theme "Artificial Intelligence, Emerging Technologies, and Immersive Solutions for Disaster and Emergency Management," the conference brings together distinguished researchers, policymakers, and professionals from over 18 countries, promoting international cooperation and the exchange of advanced knowledge and best practices.

Hosting IDRC 2025 in Cyprus marks an important milestone in advancing scientific understanding and technological preparedness through innovative tools for early detection, prevention, and sustainable recovery.

Warm congratulations to the organisers for this significant initiative and best wishes for a successful conference.

Mr. Constantinos Yiorkatzis
Chairman of the Nicosia Discrict Local Government Organisation

It is with great pleasure and pride that I welcome you to Nicosia, the heart of Cyprus, for the 8th International Disaster and Risk Conference (IDRC 2025).

Our city is honoured to host this prestigious global forum, bringing together leading minds, experts, and innovators committed to shaping a safer, more resilient future.

Nicosia stands at the crossroads of tradition and progress, a fitting setting for meaningful dialogue, knowledge exchange, and international cooperation. With its rich history and evolving urban landscape, Nicosia, embrace innovation and sustainability as key drivers for future resilience. We are proud to support an event that unites scientists, professionals, and institutions from across the globe, all working towards strengthening disaster preparedness, response, and recovery.

I wish you all a productive, inspiring, and impactful conference, and a warm and memorable stay in our city!

Mr. Charalambos Prountzos
Mayor of Nicosia

CYENS WELCOME

CYENS Centre of Excellence, with the support of the Municipality of Nicosia and leading national partners, is proud to host the 8th International Disaster and Risk Conference (IDRC 2025).

For the very first time in Cyprus, this prestigious global event will take place in the heart of Nicosia on 22–24 October 2025.

This year, IDRC has received high-quality submissions from 18 countries, reflecting a truly international community of research and practice. The programme will feature distinguished keynote speakers from six countries – among them world-leading experts and advisors to the United Nations Office for Disaster Risk Reduction (UNDRR).

The conference will highlight the groundbreaking work of CYENS in Interactive Media, Smart Systems, and Emerging Technologies, while driving global dialogue on Disaster Risk Management, Risk Reduction, and Resilience.

With strong institutional support and a diverse international presence, IDRC 2025 in Nicosia will serve as a unique platform to showcase the transformative role of AI, AR, VR, and XR in shaping safer, more resilient societies.

Professor Yiorgos Chrysanthou
General Chair, IDRC Nicosia 2025

Throughout my years of service in firefighting and crisis management, I have faced many different emergencies. Sometimes, we succeeded in saving lives, and sometimes, despite our best efforts, we could not. Those moments always left me with important questions: Are our systems failing? Do we lack the right equipment? Is more training required? Or does our collective culture need to change?

Another question has stayed with me: why, despite the tremendous advances in modern technologies, do we continue to witness ever greater disasters and crises around the world?

IDRC 2025 is a place to discuss these questions and to search for answers together. I deeply believe that if we can save even one life during a crisis, it is as if we have served all of humanity.

“Alone we can do so little. Together we can do so much.”

Dr. Amir Azizi
Executive Committee Chair, IDRC Nicosia 2025

ORGANISERS, PARTNERS & SPONSORS

CONFERENCE ORGANIZERS

CYENS CENTRE OF EXCELLENCE

GLOBAL RISK FORUM GRF DAVOS GRF

Δήμος Λευκωσίας Nicosia Municipality

MAIN PARTNER

UNDRR UN Office for Disaster Risk Reduction

COMMUNICATION SPONSOR

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ΚΟΙΝΟ ΚΥΠΡΙΩΝ

KOÏOΣ Research and Innovation Center of Excellence

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ProSafeNet

European University Cyprus

CERIDES Excellence in Innovation and Technology

CYPRUS MARINE & MARITIME INSTITUTE

Loughborough University

慶應義塾大学 Keio University Tokyo, Japan

TOHOKU UNIVERSITY

BUILD BYGGERI, BY OG MILJØ AALBORG UNIVERSITET

CONFERENCE OVERVIEW

ABOUT

The **International Disaster & Risk Conference (IDRC 2025)** is proudly hosted in Cyprus by the **CYENS Centre of Excellence**, in collaboration with the **United Nations Office for Disaster Risk Reduction (UNDRR)** and co-organized by the **Municipality of Nicosia**.

Under the theme *"AI, Emerging Tech & Immersive Solutions for Disaster & Emergency Response"*, IDRC 2025 brings together global experts, policymakers, and innovators from over **18 countries** to explore how **artificial intelligence, digital twins, and immersive technologies** are reshaping the way societies anticipate, respond to, and recover from crises.

Over three days of **keynotes, workshops, and interactive sessions**, participants will share knowledge, showcase innovation, and strengthen partnerships toward building **smarter, safer, and more resilient communities** worldwide.

PAST IDRCs

CONFERENCE COMITTEES

PROFESSOR
WALTER AMMANN
Honorary Chair

PROFESSOR
YIORGOS CHRYSANTHOU
General Chair

PROFESSOR
RAJIB SHAW
Scientific Committee Chair
& Keynote Speaker

PROFESSOR
YUICHI ONO
Publication Chair
& Keynote Speaker

PROFESSOR
DILANTHI AMARATUNGA
Sessions Chair
& Keynote Speaker

PROFESSOR
MICHAEL HAVBRO FABER
Workshops Chair
& Keynote Speaker

GAVRIIL
XANTHOPOULOS
Keynote Speaker

AMIR AZIZI
Executive
Committee Chair

REZA BATHAEE
International
Committee Chair

ALI NAJM
Web Chair

STYLIANI PETROUDI
Innovation Track Chair

MATHAIOS PANTELI
Scientific Committee
Member

DIOFANTOS HADJIMITSIS
Scientific Committee
Member

SANJAYA BHATIA
Scientific Committee
Member

PANAYIOTIS CHARALAMBOUS
Scientific Committee
Member

FOTIS LIAROKAPIS
Scientific Committee
Member

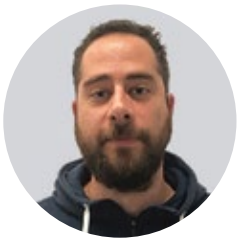
CHRISTOS IOANNOU
Scientific Committee Member

MARINA TOUMPOURI
Scientific Committee Member

CHRISTOS DIMOPOULOS
Scientific Committee Member

MARIOS STAVROU
Special Workshops Chair

VLADIMIR M. CVETKOVIĆ
Scientific Committee Member



NEOFYTOS DIMITRIOU
Scientific Committee Member

CHRISTIAN BARTHELT
Keynote Speaker

MARIOS TZOUVARAS
Scientific Committee Member

GEORGIOS BOUSTRAS
Scientific Committee Member

PIERANTONIOS PAPAZOGLOU
Scientific Committee Member

CONFERENCE AGENDA

	WEDNESDAY, 22 OCTOBER 2025 — DAY 1	
	NICOSIA MUNICIPALITY CONFERENCE	CYENS CENTRE OF EXCELLENCE
17:30–18:45	OPENING CEREMONY AND REMARKS	——
18:45–20:00	——	NETWORKING
	THURSDAY, 23 OCTOBER 2025 — DAY 2	
	NICOSIA MUNICIPALITY CONFERENCE	CYENS CENTRE OF EXCELLENCE
9:00–10:30 SESSIONS A1 & B1	BUSINESS CONTINUITY REDEFINED: CYBERSECURITY, RISK & REAL-WORLD STRESS TESTS	IT-CHARM INNOVATIVE TECHNOLOGIES FOR CULTURAL HERITAGE RESILIENCE IN DISASTER MANAGEMENT
10:30-11:00		BREAK
11:00–12:30 SESSIONS A2 & B2	AI FOR DISASTER PREDICTION AND EARLY WARNING SYSTEMS (I)	TRANSFORMING GOVERNANCE FOR A SAFER FUTURE
12:30-14:00		LUNCH BREAK & PHOTOSHOOT
9:00–10:30 SESSIONS A3 & B3	INNOVATION ECOSYSTEMS, NETWORKS AND TRAINING (PANEL DISCUSSION)	IT-DRT – IMMERSIVE TECHNOLOGIES FOR DISASTER RESPONSE & TRAINING
15:30-16:00		BREAK
16:00–17:30 SESSIONS A4 & B4	"TSUNAMI READY", IN SUPPORT OF THE UN WORLD TSUNAMI AWARENESS DAY 2025 ON BUILDING TSUNAMI-READY COMMUNITIES	TECHNOLOGY IN SUPPORT OF FOREST FIRE MANAGEMENT: REALITY, POTENTIAL AND LIMITATIONS
	FRIDAY, 24 OCTOBER 2025 — DAY 3	
	NICOSIA MUNICIPALITY CONFERENCE	CYENS CENTRE OF EXCELLENCE
9:00–10:30 SESSION B5	——	SMART-RI – SMART CITIES & RESILIENT INFRASTRUCTURE
10:30-11:00		BREAK
11:00–12:30 SESSIONS A6 & B6	AI FOR DISASTER PREDICTION AND EARLY WARNING SYSTEMS (II)	COASTAL-AI: AI POWERED EARLY WARNING & RESILIENCE FOR MARINE & COASTAL ENVIRONMENTS
12:30-13:30		CLOSING CEREMONY REMARKS

DAY-TO-DAY SCHEDULE

WEDNESDAY, 22 OCTOBER 2025 — DAY 1

NICOSIA MUNICIPALITY CONFERENCE

OPENING CEREMONY AND REMARKS — 17:30–18:45

OPENING SPEECH

– Mr. Yiorgos Chrysanthou
General Chair of IDRC 2025, CYENS CoE, Cyprus

WELCOME SPEECH

– Mr. Kamal Kishore
Special Representative of the United Nations Secretary,General for Disaster Risk Reduction, and Head of UNDRR

– Mr. Constantinos Yiorkadjis
Chairman of The Nicosia District Local Government Organization

OPENING REMARKS

– Mr. Walter Ammann
GRF Davos, Switzerland

– Mr. Amir Azizi
Executive Committee Chair IDRC 2025, CYENS CoE, Cyprus

KEYNOTE SPEECH

– Mr. Rajib Shaw
Keio University, Japan

– Mr. Gavriil Xanthopoulos
Forest Fires Hellenic Agricultural Organization, Greece

COMMEMORATIVE PHOTO

CYENS CENTRE OF EXCELLENCE

NETWORKING — 18:45–20:00

An informal gathering for participants to connect, exchange ideas, and foster collaborations in a relaxed atmosphere. Wine, light platters, and refreshments will be served.

DAY-TO-DAY SCHEDULE

THURSDAY, 23 OCTOBER 2025 — DAY 2

NICOSIA MUNICIPALITY CONFERENCE

SESSION A1 — 9:00–10:30

BUSINESS CONTINUITY REDEFINED: CYBERSECURITY, RISK & REAL-WORLD STRESS TESTS

CHAIR

Mr. Marios Stavrou
Head of Operation Support CY, Cyprus

SPEAKERS

Mr. Igor Bulatenko
Mr. Joannis Deltas
Mr. Christos Theodoulou

CYENS CENTRE OF EXCELLENCE

SESSION B1 — 9:00–10:30

IT-CHARM INNOVATIVE TECHNOLOGIES FOR CULTURAL HERITAGE RESILIENCE IN DISASTER MANAGEMENT

CHAIR

Mr. Fotis Liarokapis
& Ms. Marina Toumpouri
CYENS CoE, Cyprus

SPEAKER

International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), Italy
(Online Presentation)

PAPERS

1. "Protecting the Past, Anticipating the Future: ALIPH's Use of Innovative Technologies for Safeguarding Cultural Heritage"
Adonis El Hussein, ALIPH Foundation, Switzerland

2. "Earth Observation Toolkit for Monitoring Endangered Heritage Sites"
Dante Abte, Marios Tzouvaras, Mariacristina Salvi, Hadjimitsis, ERATOSTHENES CoE, Cyprus

3. "Artificial Intelligence in Heritage Conservation: From Proactive Monitoring to Post-Disaster Reconstruction"
Mohsen Saffar Dezfuli, Jamshid Emami, University of Science and Technology, Iran
(Online Presentation)

BREAK 10:30–11:00 CYENS RECEPTION AREA

THURSDAY, 23 OCTOBER 2025 — DAY 2

NICOSIA MUNICIPALITY CONFERENCE

SESSION A2 — 11:00–12:30

AI FOR DISASTER PREDICTION AND EARLY WARNING SYSTEMS (I)

CHAIR

Amir Azizi
CYENS CoE, Cyprus

SPEAKER

Mr. Walter Ammann
GRF Davos, Switzerland

PAPERS

1. "GRAPHCSVAE: Graph Categorical Structured Variational Autoencoder for Spatiotemporal Auditing of Physical Vulnerability Towards Sustainable Post-Disaster Risk Reduction"
Joshua Dimasaka (University of Cambridge, UK), Christian Geiß (German Aerospace Center and University of Bonn, Germany), Robert Muir-Wood (Moody's Risk Management Solutions, UK) and Emily So (University of Cambridge, UK)

2. "Disaster evacuation of the old city of Nicosia"
Marios Stylianoua, Marios Demetriou, and Andreas Aristidou, University of Cyprus, Cyprus

3. "Smart Cities and Their Role in Disaster Mitigation"
Bijan Yavar, Tehran Urban Research and Planning Center (TURPC), Iran (Online presentation)

CYENS CENTRE OF EXCELLENCE

SESSION B2 — 11:00–12:30

TRANSFORMING GOVERNANCE FOR A SAFER FUTURE

CHAIR

Mr. Pierantonios Papazoglou
CERIDES CoE, Cyprus

SPEAKER

Mr. Rajib Shaw
Keio University, Japan

PAPERS

1. "Self-Reflection Paper: Knowledge Hierarchies and Power Imbalances in Post-Disaster Humanitarian Response"
Xiao HAN and Jianing Li, University College London, Department of Risk and Disaster Reduction, UK

2. "YOUTH INCLUSIVE DRR",
Eunchong Yim , George Mason University, College of Humanities and Social Sciences (CHSS), USA (online presentation)

3. "Fostering collaboration, cooperation and interoperability in training for crisis and disaster scenarios"
Maren Scheller, Technical University Leoben, Austria

4. "Role of Artificial Intelligence in Increasing the Resiliency & Independency of Persons with Disabilities in Times of Disasters as a Disaster Management Strategy"
Bijan Yavar, Tehran Urban Research and Planning Center (TURPC), Iran (Online presentation)

5. "Civil Society and AI-Enhanced Disaster Resilience in East Asia: Comparative Insights from China, Japan, and Korea"
Qingyue Du (Shandong University, China), Rajib Shaw (Keio University, Japan) (Online presentation)

LUNCH BREAK & PHOTOSHOOT — 12:30–14:00 — CYENS RECEPTION AREA

DAY-TO-DAY SCHEDULE

THURSDAY, 23 OCTOBER 2025 — DAY 2

NICOSIA MUNICIPALITY CONFERENCE

SESSION A3 — **14:00–15:30**

INNOVATION ECOSYSTEMS, NETWORKS AND TRAINING (PANEL DISCUSSION)

CHAIR

Mr. Reza Bathaee
Kefiyat Sazan, Germany

SPEAKERS

1. Mr. Christian Barthelt
Munich Re Foundation (Online presentation)

2. Mr. Leonardo Santos Salles Varallo,
Mr. Pedro Henrique Lopes Batista
National Secretariat for Peripheries of Ministry of Cities of Brazil (Online presentation)

MEMBERS

Mr. Rajib Shaw
Mr. Yuichi Ono

CYENS CENTRE OF EXCELLENCE

SESSION B3 — **14:00–15:30**

IT-DRT – IMMERSIVE TECHNOLOGIES FOR DISASTER RESPONSE & TRAINING

CHAIR

Mr. Panayiotis Charalambous
CYENS CoE, Cyprus

SPEAKER

Mr. Michael Havbro Faber
Aalborg University, Denmark

PAPERS

1. "Evaluation of AI and XR technologies in Humanitarian DRR Simulation Exercise" ,
Mark RODDY, Guillaume AUVRAY, Ciaran O'FLOINN, Laurence KNOOP, Irland and France

2. "From Data to Decisions - An XR Platform for Crisis Communication and Situational Awareness"
Edona Krasniqi, Visar Shehu (Southeast European University) , North Macedonia (Online presentation)

3. "Examining Cognitive Functioning Under Emergency"
Anastasia Stefanou (University of Cyprus), Marios N. Avraamides (CYENS CoE), Cyprus

4. "Plant Cultivation for Childhood Stress Reduction in Crises: Enhancing Efficacy via AI"
Roya Helmi, Jamshid Emami, University of Tehran, Iran (Online presentation)

BREAK — **15:30–16:00** — **CYENS RECEPTION AREA**

THURSDAY, 23 OCTOBER 2025 — DAY 2

NICOSIA MUNICIPALITY CONFERENCE

SESSION A4 — 16:00–17:30

"TSUNAMI READY", IN SUPPORT OF THE UN WORLD TSUNAMI AWARENESS DAY 2025 ON BUILDING TSUNAMI-READY COMMUNITIES

SPEAKER & CHAIR

Ms. Dilanthi Amaratunga,
Loughborough University, UK

PAPERS

1. "A Study on Route Selection Based on Environmental Cognition in Tsunami Disasters"
Akito Kikuchi, Ruka Kosuge, Shibaura Institute of Technology, Japan (Online presentation)

CYENS CENTRE OF EXCELLENCE

SESSION B4 — 16:00–17:30

TECHNOLOGY IN SUPPORT OF FOREST FIRE MANAGEMENT: REALITY, POTENTIAL AND LIMITATIONS

SPEAKER

Mr. Gavriil Xanthopoulos
Forest Fires Hellenic Agricultural Organization "DIMITRA", Institute of Mediterranean Forest Ecosystems, Greece

DAY-TO-DAY SCHEDULE

FRIDAY, 24 OCTOBER 2025 — DAY 3

NICOSIA MUNICIPALITY CONFERENCE

CYENS CENTRE OF EXCELLENCE

SESSION B5 — 9:00–10:30

SMART-RI – SMART CITIES & RESILIENT INFRASTRUCTURE

CHAIR

Mr. Mathaios Panteli
KIOS CoE, Cyprus

SPEAKER

Ms. Dilanthi Amaratunga
University of Huddersfield, UK

PAPERS

1. "Innovation Ecosystem for Disaster Risk Reduction through Platform Economy"
Ratnesh Kumar, Coalition for Disaster Resilient Infrastructure (CDRI), India

2. "Governance Gaps in Arctic Disaster Risk Assessment: A Comparative Policy Analysis of AI and State Institutions (Wildfires, Oil Spills, Seismic Events)"
Olga Derendiaeva, Sun Yat-sen University, China (Online presentation)

3. "Next-Generation Emergency Communication Systems: Design and Evaluation of the e112 Mobile Application Platform"
Katerina Ioannidou (Uppsala University, Sweden), Marios D. Dikaiakos (University of Cyprus), and Athena Stassopoulou (University of Nicosia, Cyprus)

4. "An AI-Driven Digital Twin Framework for Urban Infrastructure Resilience under Climate Change: A Case Study of Hamedan, Iran"
Bita Rouhi (Municipality of Hamedan), Amirhossein Hanifi (Bu-Ali Sina University), and Khosro Mirzaei (Municipality of Tehran), Iran (Online presentation)

BREAK — 10:30–11:00 — CYENS RECEPTION AREA

FRIDAY, 24 OCTOBER 2025 — DAY 3

NICOSIA MUNICIPALITY CONFERENCE

SESSION A6 — 11:00–12:30

AI FOR DISASTER PREDICTION AND EARLY WARNING SYSTEMS (II)

CHAIR

Marios Tzouvaras
ERATOSTHENES CoE, Cyprus

PAPERS

1. "Earthquake-Modeled Vibrations Activate FAK Pathway for Neurorehabilitation: Clinical Pilot and Disaster Framework"
Arash Amin, Mahsa Jalalian, Mehdi Khosrovani, Shahrooz Mansori-rad, (EQAZMA Institute), Iran, (Online presentation)

2. "Deep leaning to estimate catastrophic health spending risks in disaster-affected, data scarce settings"
Rozana Himaz, Dimitra Salmanidou, Saman Ghafarian (UCL, UK)

3. "Analysis of Climate Change Impacts on Urban Infrastructure Resilience Using Satellite Data and Artificial Intelligence: A Case Study of Hamedan City"
Bita Rouhi (Municipality of Hamandan), Amirhossein Hanifi (Bu-Ali Sina University) Mehdi Rastgo (National Disaster Management Organization), Iran (Online presentation)

4. "Intelligent Networks for Efficient Communication During Crises: A Step Forward"
Bijan Yavar , Tehran Urban Research and Planning Center (TURPC),Iran (Online presentation)

CYENS CENTRE OF EXCELLENCE

SESSION B6 — 11:00–12:30

COASTAL-AI: AI POWERED EARLY WARNING & RESILIENCE FOR MARINE & COASTAL ENVIRONMENTS

CHAIR

Mr. Neofytos Dimitriou
CMMI CoE, Cyprus

SPEAKER

Mr. Yuichi Ono
Tohoku University, Japan

PAPERS

1. "AXOLOTL: An AI-Driven Hurricane Forecasting Module in the Aardvark Architecture"
Hernández-Bennetz Mónica Belén, Peréz-Pompermayer Delio, Tecnológico de Monterrey, Mexico

2. "Is Waste Blocking Our Cities? A Multisource Approach to Understanding Flood Disruption in Nairobi"
Wenlan Zhang, Chen Zhong (University College London, UK)

3. "The necessity of implementing river management and safety projects in populated areas in line with the National Disaster Risk Reduction program"
Fatemeh Falahati, Mahsa Bashiri, Natural Disaster Research Institute (NDRI), Iran (Online presentation)

4. "ECO-BEACHTECH: Addressing coastal erosion and flooding of beaches with tourist and ecological importance using environmentally friendly methods, in light of climate change"
ERATOSTHENES CoE, Mr. Christodoulos Mettas, Cyprus

5. "Investigation of Indigenous Community Participation in Enhancing Urban Flood Resilience"
Vahid Azimi (University of Tehran), Mahsa Azizi, Iran (Online presentation)

DAY-TO-DAY SCHEDULE

FRIDAY, 24 OCTOBER 2025 — DAY 3

NICOSIA MUNICIPALITY CONFERENCE	CYENS CENTRE OF EXCELLENCE
5. "AI-OBSERVER: Enhancing Earth Observation capabilities of the Eratosthenes Centre of Excellence on Disaster Risk Reduction through Artificial Intelligence" Marios Tzouvaras (Cyprus), Gerd Reis, Fabio Del Frate (Italy), Haris Zacharatos (Germany), Diofantos Hadjimitsis (Cyprus)	6. "Standards for Digital Risk Mitigation in Urban Disaster Resilience: A Case Study of Flood-Resilient Cities" Givehchi, Nasser Mehrdadi, Maryam Mehrdadi, University of Tehran, Iran

CLOSING CEREMONY REMARKS — 12:30–13:30 — CYENS CENTRE OF EXCELLENCE

AMALGAMATION CHOIR

AMALGAMATION Choir is an all-female choir from Cyprus, consisting of women of all ages and backgrounds. Guided by the vision of founder and conductor, Vasiliki Anastasiou, the choir performs traditional cypriot and cross-border folk melodies, celebrating oral traditions and local histories, from different time periods and cultures of the broader Mediterranean region.

The choir reinterprets traditional, folk and original songs with progressive harmonies and lyric adaptations, expanding and voicing perspectives which might otherwise have remained unheard. The women's voices come together embodying inclusivity, unity, resonance and acceptance, embracing all identities, voices, and histories.

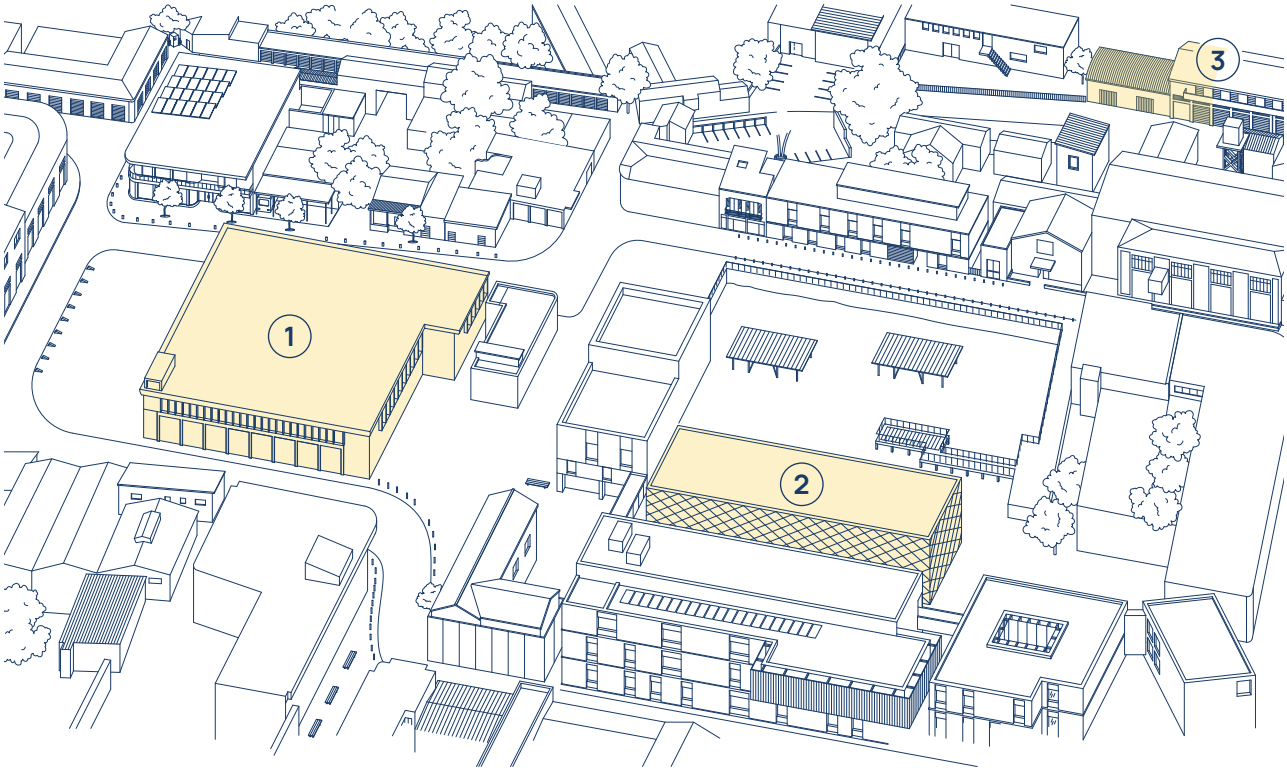
The Amalgamation Choir has performed in Cypriot and European backdrops; the most recent performances include the European Commission's Christmas Concert in Stockholm, Sweden; Westminster Abbey and the House of Commons for the Commonwealth Day 2023, London, UK; the BBC Radio, London, UK; the Chapelle Sainte Philomène & Temple du Change, Lyon, France; and the Buffer Fringe Festival, Nicosia, Cyprus.

For news and info, please visit:
https://www.instagram.com/amalgamationchoir
https://www.instagram.com/anastasiou_vasiliki

NETWORKING EVENT

Following the Opening Ceremony and Welcome Remarks of the IDRC Conference, all participants are warmly invited to a Networking Event at the CYENS Centre of Excellence Reception Area. This will be a great opportunity for participants to connect, exchange ideas, and foster collaborations in a relaxed atmosphere. Wine, light platters, and refreshments will be served. We look forward to seeing you there!

CONFERENCE MAP



CYENS CENTRE OF EXCELLENCE

Dimarchou Lellou Demetriadi 1, Nicosia 1016, Cyprus

NICOSIA MUNICIPALITY CONFERENCE

Eptanisou 11, Nicosia 1016, Cyprus

THE STUDIO (THEATRO POLIS OPAP)

Tempon 10-12, Old powerhouse, Nicosia 1016, Cyprus

THE CITY OF NICOSIA

Nicosia is the largest city on the island of Cyprus. It is located near the centre of the Mesaoria plain, on the banks of the River Pedieos.

Nicosia is the capital and seat of government of the Republic of Cyprus, and as such is the farthest southeast of all EU member states' capitals. It has been continuously inhabited for over 4,500 years and has been the capital of Cyprus since the 10th century. Nicosia is divided into the southern Greek Cypriot part and the occupied by Turkey part.

GENERAL INFORMATION ABOUT CYPRUS

Cyprus is the third largest island in the Mediterranean Sea. It measures 240km long from end to end and 100km wide at its widest point.

The physical relief of the island is dominated by two mountain ranges, the Troodos Mountains and the smaller Kyrenia Range, and the central plain they encompass, the Mesaoria. The Troodos Mountains cover most of the southern and western portions of the island and account for roughly half its area. The highest point on Cyprus is Mount Olympus at 1952m, located in the centre of the Troodos range. The narrow Kyrenia Range, extending along the northern coastline, occupies substantially less area, and elevations are lower, reaching a maximum of 1024m.

Cyprus is divided into 6 districts named after the main towns, Lefkosia, Lemesos, Larnaka, Ammochostos, Pafos and Keryneia.

PAPERS ABSTRACT

Protecting the Past, Anticipating the Future: ALIPH's Use of Innovative Technologies for Safeguarding Cultural Heritage

Adonis El Hussein[a]

[a] *International Alliance for the Protection of Heritage (ALIPH Foundation), Switzerland*

This paper presents different ways in which the ALIPH Foundation supports initiatives adopting innovative digital technologies in the protection of cultural heritage threatened by conflict, climate change, and disasters. ALIPH has supported more than 500 projects globally since 2017, increasingly leveraging cutting-edge digital technologies to enhance documentation, inventorying, monitoring, preparedness, and recovery. By way of the following case studies—the Sudan Memory digitization project, post-earthquake 3D documentation of Aleppo monuments, and Bangladesh capacity building—the paper demonstrates how digital inventories, photogrammetry, UAV imaging, and 3D modelling both conserve cultural heritage and equip local professionals with critical skills to build resilience. Nevertheless, findings of an independent evaluation underline the importance of usability and flexibility of digital outputs for conservation practice. Going forward, ALIPH and partners are launching HeritageWatch.AI, a groundbreaking programme combining artificial intelligence and satellite imaging for early warning, damage assessment, and anti-looting monitoring. By fusing innovative technologies and partnerships with strong technical expertise in documentation, programming, and cultural heritage conservation, ALIPH aims to streamline expertise, build sustainable solutions, and contribute to long-term resilience of cultural heritage in the face of conflict, climate change, and disaster.

Keywords: Cultural heritage protection, Disaster risk management, Digital documentation, 3D Modeling, Photogrammetry, Capacity building, Artificial intelligence (AI), HeritageWatch.AI, IDRC 2025

A Study on Route Selection Based on Environmental Cognition in Tsunami Disasters.

Akito Kikuchi[a], Ruka Kosugeb[b]

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[b] *Shibaura Institute of Technology, Department of Architecture, Graduate School of Science and Engineering, Tokyo, Japan*

The 2011 Great East Japan Earthquake revealed a critical gap between official evacuation plans and residents' actual behavior, rooted in the disparity between objective hazard data and subjective environmental perception. This study investigates this gap through a mixed-methods approach in four distinct coastal districts with unique geographical characteristics within Futtsu City, Japan. We combined questionnaire surveys (N=161) exploring risk perception together with drawing a cognitive map where residents sketched their intended evacuation routes and landmarks.

While statistical analysis of survey data failed to identify consistent predictors for risk perception, the cognitive map analysis yielded critical findings. A substantial number of residents drew evacuation paths that traversed predicted tsunami inundation zones. Furthermore, significant distortions were found between residents' perceived and actual home locations. Standard Deviational Ellipse (SDE) analysis quantified considerable ambiguity and systematic bias in the spatial cognition of crucial wayfinding landmarks, such as public facilities and commercial stores.

These findings indicate that residents navigate using a subjective "cognitive hazard map" that often contradicts official risk information. Effective disaster risk reduction must therefore move beyond mere information dissemination and adopt a human-centered approach, enhancing the cognitive legibility of urban environments to ensure safer and more intuitive evacuation.

Keywords: Tsunami, cognitive map, SDE, Route selection, Regional image

Examining Cognitive Functioning Under Emergency

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This study examined how pressure induced by emergency conditions simulated in Virtual Reality (VR) affects cognitive processes related to attention and working memory. While previous research has explored the impact of arousal on cognitive mechanisms, there is limited understanding of how cognitive processes are influenced under pressure in immersive VR settings.

Twenty-nine university students completed three VR-based cognitive tasks: 1) a Visual Search task measuring how quickly participants could find a target among distractors, 2) a Go/No-Go task measuring the ability to withhold automatic responses, and 3) the Corsi Block-Tapping task measuring the capacity of working memory. Each task was carried out under both normal and emergency conditions. Data were analyzed using repeated-measures ANOVAs, t-tests, and correlational analyses in JASP and R-Studio.

Results showed that participants located the targets faster in conjunction trials of the Visual Search task (i.e., trials where distractors shared features with the target) under emergency than under normal conditions, particularly in the largest displays of 40 stimuli. In contrast, their response inhibition performance was impaired in the Go/No-Go task under emergency conditions. Finally, their working memory capacity remained largely unaffected by the emergency manipulation. Overall, these results suggest that emergencies may have differential effects on different cognitive tasks: they may improve performance in attentiondemanding tasks that require filtering out distractions but at the same time reduce the ability to suppress automatic responses. These findings have important implications for developing training tools to enhance cognitive skills and protect against the adverse effects of emergencies.

Keywords: Virtual reality, cognition, attention, working memory, risk management, arousal, maritime, emergency

Earthquake-Modeled Vibrations Activate FAK Pathway for Neurorehabilitation: Clinical Pilot and Disaster Framework

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Mechanical stimulation is a promising noninvasive approach for promoting neural repair, yet its integration with seismology has not been explored. In this pilot study, we examined whether controlled, earthquake-modeled mechanical vibrations delivered via a custom-built six-degrees-of-freedom (6-DOF) seismic simulator can facilitate neurological recovery in patients with chronic disorders. Four participants (one complete spinal cord injury, one with Parkinson's disease, one with multiple sclerosis, and one with post-traumatic stress disorder) underwent six sessions each (60–120 minutes per session). Despite the absence of a classical pre/post controlled design, consistent functional improvements were observed: both SCI patients regained voluntary motor function and the ability to stand; the Parkinson's patient demonstrated near-normal gait despite delayed levodopa intake; the MS patient recovered distal sensation and showed improved respiratory performance; and the PTSD participant exhibited reductions in cognitive symptoms and recalibrated spatio-temporal perception. No serious adverse events occurred; the only observed side effect was a reversible shift in menstrual cycle timing in one nearby observer. We propose that the mechanism involves activation of focal adhesion kinase (FAK) mechano-transduction pathways, leading to autophagy, axonal regeneration, and potential reprogramming within damaged circuits. These results suggest translational potential for integrating earthquake-modeled vibration therapy into neurorehabilitation, with implications for disaster recovery frameworks. Further controlled trials are warranted.

Keywords: Earthquake-Modeled Vibration, Mechanotransduction, FAK, Neurorehabilitation, Spinal Cord Injury, Parkinson's Disease, Disaster Resilience

Smart Cities and Their Role in Disaster Mitigation

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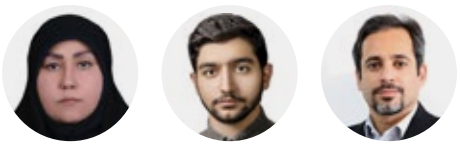
The increasing frequency and severity of natural and human-made disasters necessitate the development of adaptive, resilient, and technologically integrated urban systems. Smart cities, equipped with advanced Information and Communication Technologies (ICT), artificial intelligence (AI), and interconnected sensor networks, offer substantial potential for effective disaster mitigation. This paper explores the multifaceted role of smart cities in lowering disaster risks, enhancing preparedness, and accelerating recovery through real-time analytics, digital intelligence, and inclusive socio-technical governance mechanisms. Internet of Things (IoT) sensor networks enable continuous environmental and infrastructural condition monitoring, facilitating early warnings for floods, earthquakes, and wildfires. Machine learning models predict hazard trajectories, identify vulnerable zones, and optimize evacuation processes. Geographic Information Systems (GIS) enhance situational awareness by mapping risks, resources, and population movements. Furthermore, disaster response in smart cities leverages participatory digital platforms for crowd-sourced data and delivers localized alerts via mobile applications. Blockchain technology fosters transparency by securing supply chains and emergency resource tracking. Resilient infrastructure—such as smart grids, automated water systems, and autonomous vehicles—ensures service continuity and aids rapid recovery. Digital twins provide risk-free testing environments for disaster mitigation strategies before real-world deployment. Strategic governance—emphasizing cross-sector collaboration, cybersecurity, equitable access, ethical AI, and data privacy—sustains public trust and effectiveness. Through strategic design and inclusive management, smart cities evolve from reactive responders into proactive disaster mitigators, embedding resilience at the core of future urban growth.

Analysis of Climate Change Impacts on Urban Infrastructure Resilience Using Satellite Data and Artificial Intelligence: A Case Study of Hamedan City

Bita Rouhi[1], Amirhossein Hanifi[2], Dr. Mehdi Rastgoo[3]



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Climate change, through the intensification of extreme events such as heat waves, flash floods, droughts, and land subsidence, has emerged as one of the most critical threats to the sustainability of urban infrastructure. Developing cities, characterized by rapid urban growth, high population density, and limited adaptive capacity, are particularly vulnerable to such cascading hazards. Addressing these challenges requires advanced frameworks capable of integrating multi-source data, enabling real-time monitoring, predictive modeling, and data-driven decision support. This study introduces an Artificial Intelligence-driven Digital Twin (DT) framework designed to assess and enhance the resilience of critical infrastructures in Hamedan, Iran. The framework integrates multi-source remote sensing data—including Sentinel-1 Synthetic Aperture Radar (SAR), Sentinel-2 optical/multi-spectral imagery, and Landsat-8 thermal bands—alongside field observations and IoT sensor data. Key environmental indicators such as Land Surface Temperature (LST), Normalized Difference Vegetation Index (NDVI), Normalized Difference Water Index (NDWI), soil moisture dynamics, and ground displacement were extracted and stored in a spatio-temporal database. These datasets were then modeled using advanced machine learning and deep learning algorithms, including Random Forest (RF), XGBoost, and CNN-LSTM, to capture complex spatial–temporal interactions and predict climate-induced risks. Results from the case study demonstrate that combining multi-source satellite imagery with local ground data improved the accuracy of identifying high-risk zones—such as urban heat islands and subsidence-prone areas—by nearly 15% compared to single-source approaches. Furthermore, the proposed system achieved a Time to Decision (TTD) of less than three minutes and reduced the False Alarm Ratio (FAR), highlighting its potential for real-time emergency management. Beyond technical performance, the

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Role of Artificial Intelligence in Increasing the Resiliency & Independency of Persons with Disabilities in Times of Disasters as a Disaster Management Strategy

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Persons with disabilities (PWDs) represent one of the most vulnerable groups during disasters, often facing barriers in mobility, communication, and access to emergency resources. Traditional disaster management frameworks frequently overlook their specific needs, leading to disproportionate risks and dependency on external support. Artificial intelligence (AI) offers transformative opportunities to enhance both resiliency and independence of PWDs by enabling adaptive, inclusive, and data-driven disaster strategies. AI-powered assistive technologies—such as predictive communication devices, smart wearables, and autonomous navigation systems—can provide real-time situational awareness, early warning alerts in accessible formats, and personalized evacuation guidance. Machine learning algorithms integrated with geospatial and social data can anticipate individual vulnerabilities, optimize resource allocation, and ensure inclusive sheltering and medical services. Moreover, AI-driven decision support systems can strengthen self-reliance by reducing dependence on human intermediaries through automated interpretation of complex disaster information into user-specific actionable steps. This empowerment not only minimizes risks but also promotes dignity and agency among PWDs. At a systemic level, embedding AI into disaster governance enhances inclusivity by shifting from reactive assistance toward proactive resilience-building. However, ethical considerations such as algorithmic bias, data privacy, and equitable access must be addressed to avoid reinforcing existing disparities. In conclusion, AI has the potential to redefine disaster management by positioning the resiliency and independency of PWDs as a central strategy, contributing to more just, adaptive, and sustainable disaster-resilient societies.

Intelligent Networks for Efficient Communication During Crises: A Step Forward

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In today's connected world, crises such as natural disasters, technological failures, and large emergencies often disrupt traditional communication systems, impeding timely information flow. Intelligent networks enhanced by artificial intelligence (AI), adaptive routing, cognitive radios, and distributed designs provide a resilient alternative that maintains and improves communication under adverse conditions. These networks autonomously make decisions, dynamically reconfigure, and optimize resources in real time. AI-driven traffic prioritization ensures critical messages—such as emergency alerts, rescue coordination, and medical data—are delivered swiftly. Machine learning anticipates congestion, avoids overload, and redirects traffic through alternate paths, while Software-Defined Networking (SDN) and Network Function Virtualization (NFV) allow flexible resource deployment without physical changes. Combining cellular, satellite, and ad-hoc mesh connections, cognitive radios dynamically access underutilized spectrum. Edge computing alleviates backhaul load by processing data locally, accelerating response decisions. Human-centric elements boost resilience through predictive analytics, multilingual protocols, and authenticated crowd-sourced data. Cybersecurity with AI-powered intrusion detection safeguards privacy and system integrity. Simulations show intelligent networks can cut latency up to 60%, increase delivery rates by over 40%, and enhance coordination among responders. These adaptive, self-optimizing systems mark a paradigm shift in crisis management frameworks.

framework emphasizes the integration of community-based data and supports heritage protection through Historic Building Information Modeling (HBIM), offering insights for safeguarding vulnerable cultural assets such as the UNESCO World Heritage site of Hegmataneh. Overall, the findings suggest that embedding artificial intelligence and digital twin technologies into urban risk governance provides a scalable, transferable, and policy-relevant tool for optimizing resource allocation, guiding climate adaptation strategies, and strengthening the resilience of cities facing.

Keywords: Climate Change, Digital Twin, Artificial Intelligence, Urban Resilience, Multi-Hazard Risk, Satellite Data, Governance Pyramid, MCR2030, Hamedan City

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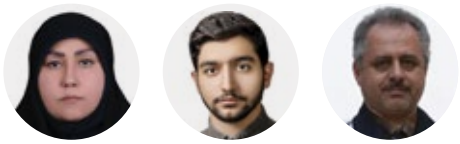
An AI-Driven Digital Twin Framework for Urban Infrastructure Resilience under Climate Change: A Case Study of Hamedan, Iran

Bita Rouhi[1], Amirhossein Hanifi[2], Dr. Khosro Mirzaei[3]



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The growing intensity of natural and anthropogenic hazards has made urban resilience a central challenge of the twenty-first century. Developing cities, marked by rapid expansion, dense populations, and limited institutional capacity, are especially exposed to the compound effects of climate change and multi-hazard interactions. Meeting these challenges requires proactive, data-driven approaches capable of real-time monitoring, predictive modeling, and adaptive decision-making. This study introduces an Artificial Intelligence–driven Digital Twin (DT) framework designed to enhance the resilience of urban infrastructure, with Hamedan, Iran, as the case study.

The framework integrates satellite datasets—Sentinel-1 SAR, Sentinel-2 optical imagery, and Landsat-8 thermal data—together with IoT sensor networks and local observations. Data streams are processed using cloud–edge architectures and advanced fusion methods to create a dynamic, continuously updated digital replica of critical systems. Key indicators (NDVI, NDWI, LST) were extracted and modeled with machine learning (Random Forest, XGBoost) and deep learning (CNN-LSTM). While RF and XGBoost captured non-linear relations between climate drivers and environmental responses, CNN-LSTM provided superior accuracy by learning spatial and temporal dependencies.

The novelty of this study lies in three contributions: (1) integration of community-based risk data and neighborhood drills into the DT, linking social input with technical modeling; (2) application of hybrid deep learning for multi-hazard simulation, improving robustness and predictive power; and (3) inclusion of a cultural heritage module that uses HBIM, IoT, and AI-based damage assessment to protect assets such as the UNESCO World Heritage site of Hegmataneh.

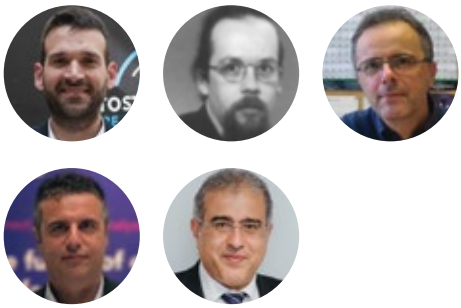
Results show that CNN-LSTM reduced RMSE by about 20% and achieved R^2 values above 0.90, outperforming classical models. GIS-based risk maps revealed that neighborhoods with low vegetation (NDVI), high impervious cover, and elevated LST face greater exposure to floods, heatwaves, and service disruptions. The framework also shortened Time to Decision (TTD) to under five minutes and reduced false alarms, confirming its operational value.

Practically, the DT framework can act as a Decision Support System for municipalities and heritage agencies. Its modular and scalable design ensures adaptability to other urban contexts. By merging AI, IoT, big data, and community participation, the framework offers a transferable model for strengthening resilience in historic and fast-growing cities, supporting the vision of sustainable and future-ready urban systems.

Keywords: Artificial Intelligence (AI), Digital Twin,Urban Resilience, Multi-Hazard Risk Assessment, CNN-LSTM, IoT Sensor Network, Remote Sensing, Community-Based Data, Climate Change Adaptation, Hamedan, Iran

AI-OBSERVER: Enhancing Earth Observation capabilities of the Eratosthenes Centre of Excellence on Disaster Risk Reduction through Artificial Intelligence

Marios Tzouvaras[1], Gerd Reis[2], Fabio Del Frate[3], Haris Zacharatos[4], Diofantos Hadjimitsis[1]



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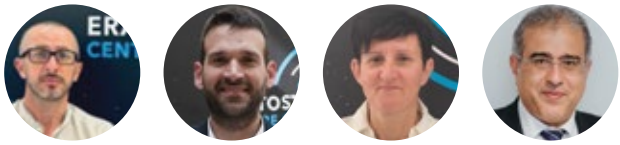
Nowadays, Artificial Intelligence (AI) has a major impact, and its influence is predicted to expand rapidly in many sectors. One area where there is considerable potential for AI is in the field of Earth Observation (EO), where it can be used to manage large datasets, retrieve valuable information and produce new outputs and services. AI was one of the missing technological areas that needed to be integrated in the EO capabilities of the ERATOSTHENES Centre of Excellence (ECoE). The AI-OBSERVER Horizon Europe Twinning project that received funding from the European Union (HORIZON-WIDERA-2021-ACCESS-03, G.A. 101079468), aimed to significantly enhance the scientific excellence and innovation capacity of the ERATOSTHENES Centre of Excellence on the topic of AI used on EO for Disaster Risk Reduction. This was achieved through several capacity building activities on AI for EO applications in earthquakes, landslides, coastal erosion, fires, floods and marine pollution, upgrading and modernising its existing department of Resilient Society, and assisting the ECoE to reach its long-term objective of raised excellence on AI for EO on environmental hazards. The strategic partnership between the ECoE (coordinator) and two internationally leading research institutions, the German Research Centre for Artificial Intelligence (DFKI) from Germany and the University of Rome Tor Vergata from Italy, led to a research exploratory project on the application of AI on EO for multi-hazard monitoring andassessment in Cyprus. Moreover, CELLOCK led the project's commercialisation, exploitation and product development aspects. All outputs were disseminated and communicated to stakeholders, the research community, and the public, assisting the ECoE to accomplish its exploitation goals, by creating strong links with various stakeholders from academia and industry in Cyprus and beyond, that ECoE will capitalise on, long after the end of the project.

Keywords: Earth Observation, Artificial Intelligence, Disaster Risk Reduction, Environmental hazards, Twinning

Earth Observation Toolkit for Monitoring Endangered Heritage Sites

D. Abate[1], M. Tzouvaras[1], M.C. Salvi[1], D. Hadjimitsis[1]



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Satellite imagery analysis and remote sensing techniques enable the systematic monitoring of changes at archaeological and cultural heritage sites [1,2,3,4]. Through image recognition and automated detection algorithms, features such as looting pits, illegal excavations, or large-scale site destruction can be identified with increasing accuracy. These technologies provide critical early-warning capabilities and contribute to risk assessment frameworks, allowing the evaluation of site vulnerability and prioritisation of protective measures. By flagging potential damage or disturbance, they enable timely interventions and can alert authorities that cultural objects from specific sites or regions may soon enter the market. Furthermore, remote sensing has proven particularly valuable for documenting and quantifying extensive heritage destruction during periods of armed conflict or other crises, supporting both immediate response and long-term preservation strategies.

The "Earth Observation Toolkit for Monitoring Endangered Heritage Sites" presented in this study seeks to harness the power of satellite data, remote sensing, and artificial intelligence to better safeguard cultural heritage at risk [5]. At its core, it will establish a satellite imagery brokering system, enabling the systematic mining of diverse datasets, from optical archives to synthetic aperture radar

(SAR), so that information on heritage sites can be accessed and integrated more efficiently. Building on this foundation, advanced processing workflows enhanced by machine learning (Figure 2) have been developed, capable of detecting early signs of damage or threat, whether caused by looting activities, uncontrolled development, natural hazards, or armed conflict.

Beyond detection, the toolkit is designed to transform observations into timely and reliable alerts, providing heritage authorities and law enforcement agencies with actionable knowledge. These alerts, combined with quantitative risk assessments, will not only support immediate site protection but also inform long-term management strategies and anticipate the appearance of cultural objects from specific endangered locations on the illicit market. In doing so, the toolkit bridges technological innovation with cultural heritage protection, offering a proactive system that strengthens responses, supports evidence-based decision-making, and reinforces sustainable safeguarding strategies.

YOUTH INCLUSIVE DRR

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Sendai Framework 2015-2030 values multi-hazard, multisectoral, inclusive, and accessible disaster risk reduction (DRR) policies and practices. To enhance each of the elements, many countries, including the Republic of Korea (ROK), have constantly developed their own, particularly, youth-engagement programmes to make DRR more inclusive and accessible. In particular, the Korean School Safety Programme (KSSP) was jointly developed and initiated in 2016 by the United Nations Disaster Risk Reduction (UNDRR) and the Ministry of the Interior and Safety (MOIS). The programme was successfully implemented by educating more than 49,000 students and teachers to raise DRR awareness and disaster preparedness and resilience by 2024. However, there are a few significant limitations to be improved. Firstly, it has mainly focused on the transfer of knowledge to students from educators, especially those of lower grades. Secondly, it lacks detailed, reliable data to measure its effectiveness, which directly affects disaster preparedness and resilience. Hence, this paper aims to collect both qualitative and quantitative data of the ROK and successful cases of other countries in youth engagement DRR activities, which are essential to evaluate existing policies and practices in DRR discourse. The study finds and describes that countries such as Bangladesh and India share a similar collection and measurement of the data to assess their youth-engagement DRR programmes, although they are not specifically related to KSSP. Based on this paper, future research can take trials of collection and analysis of data from students, teachers, and officers in the related organisations to improve the mechanism and curricula.

The necessity of implementing river management and safety projects in populated areas in line with the National Disaster Risk Reduction Program.
A study from Natural Disaster Research Institute (NDRI) Tehran / I.R of Iran

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Nowadays, the occurrence of extreme events and climate change, together with the expansion of human activities and encroachment on natural areas, have led to increased flood-related damages. Rural settlements, in particular, due to factors such as geographical location, environmental characteristics, physical-spatial structure, and level of development, often suffer the greatest losses when hazards occur. Therefore, in this study, based on an analysis of field visits to 1,418 villages

across Iran, the vulnerability of rural areas to flood hazards was assessed. After identifying the most frequent solutions proposed for improving flood safety in these villages, one village was selected for detailed analysis, including a comprehensive safety plan and hydrological and hydraulic modeling. The results showed that 1,169 of the surveyed villages face flood risks, and the need for river and channel management was the most commonly recommended safety measure. Considering the widespread problems of inappropriate site selection and the expansion of construction along riverbanks, non-compliance with riverbed and floodplain boundaries, and especially the high costs of reconstruction and rehabilitation after floods, planning and action aimed at flood prevention and risk reduction aligned with the National Disaster Risk Reduction Program strengthening the integration of risk reduction measures into development plans, implementing river and channel management and safety projects in populated areas, and removing obstructive encroachments within riverbeds and floodplain boundaries are among the key priorities for effective flood risk management.

Keywords: Flood, River Corridor, Safety Measures, River Management, Hydraulic Modeling

Evaluation of AI and XR technologies in Humanitarian DRR Simulation Exercise

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The project evaluates the application of extended reality (XR) and artificial intelligence (AI) to humanitarian emergency readiness and response (ERR) simulation exercises (SimEx) within the EU-funded CORTEX² project. The objective was to determine the operational relevance of XR-supported immersive training for cooperation in ERR crisis management, using a proof-of-concept developed by XR Ireland in collaboration with Action Contre la Faim (ACF) with platform components developed by Alcatel Lucent, DFKI, Linagora, CEA and other stakeholders from within the EU-funded CORTEX² project.

Three pilots were implemented: (1) an arrival briefing introducing key concepts, (2) an alert and response strategy exercise in collaborative team settings, and (3) a response implementation simulation engaging participants with AI avatars in immersive environments. Evaluation was conducted with ACF's emergency roster personnel through structured exercises and post-simulation surveys. Results indicate limited added value of XR for theoretical briefings, moderate value for collaborative planning, and highest potential for response implementation, particularly for practicing soft-skills and decision-making and negotiation under pressure. Usability was constrained by interface complexity and speech recognition issues, but participants identified XR and AI as valuable for experiential training when applied selectively.

Findings recommend targeted deployment of XR in defined phases of emergency response training, streamlined user interface design, and dual support for VR and desktop access. The research contributes to the design of technology-mediated humanitarian training by aligning immersive methods with specific operational need.

Keywords: Humanitarian, user study, emergency preparedness, resilience, sendai framework, extended reality, virtual reality, artificial intelligence, disaster risk reduction, simulation exercise, IDRC 2025

PAPERS ABSTRACT

Artificial Intelligence in Heritage Conservation: From Proactive Monitoring to Post-Disaster Reconstruction

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Recent studies have demonstrated that certain animals are capable of perceiving environmental changes and exhibiting unusual behaviors up to 24 hours before an earthquake. The underlying hypothesis suggests that these organisms detect ultra-low frequency (ULF) electromagnetic waves through their natural biosensors and respond accordingly. However, monitoring and accurately analyzing such behavioral changes in either laboratory or natural settings remains highly challenging due to the complexity and variability of movement patterns, as well as the limitations of conventional ethological tools.

This paper proposes a novel artificial intelligence (AI)-based framework that serves as an analytical intermediary between animal behavior and earthquake early-warning systems. By employing machine learning algorithms and computer vision techniques, the framework enables continuous monitoring of animals, the detection of abnormal behavioral patterns, and the discrimination of ordinary activities from responses potentially triggered by ULF waves. Consequently, the reliance on error-prone traditional methods is reduced, while a more precise modeling of correlations between seismic precursors and biological responses becomes possible.

Preliminary results indicate that deep neural networks applied to video and sensor data can successfully capture subtle but meaningful behavioral anomalies, thereby enhancing the accuracy of pre-seismic warnings available to researchers. This approach represents a significant step toward integrating biological sciences with advanced technologies and holds promise for improving the reliability of earthquake prediction systems.

Artificial Intelligence in Heritage Conservation: From Proactive Monitoring to Post-Disaster Reconstruction

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Artificial Intelligence (AI) plays a transformative role in heritage conservation and post-disaster reconstruction. In proactive conservation, AI leverages machine learning and computer vision to analyze satellite/drone imagery and real-time sensor networks (temperature, humidity, vibrations), enabling early detection of structural anomalies (cracks, moisture ingress, subsidence) and prediction of natural hazards (earthquakes, floods, erosion) to facilitate targeted preventive measures.

For post-disaster reconstruction, AI provides critical tools:

1. Modeling & Documentation: AI-integrated LiDAR/photogrammetry automates processing to create precise digital twins of damaged structures for archival and planning.
2. Simulation & Analysis: Algorithms simulate structural behavior under stress, identify vulnerabilities, optimize reinforcement designs *in silico*, and enable automated damage assessment/cost estimation.
3. Virtual Reconstruction & Planning: Digital models allow scenario testing to optimize historical authenticity, structural durability, safety, and cost-effectiveness, including replication of intricate details.
4. Material & Process Optimization: AI recommends compatible restoration materials based on historical data and current conditions, while optimizing construction sequencing and resource allocation.
5. Crisis Management: Rapid analysis of drone/satellite/ground data prioritizes critical sections/artifacts and optimizes emergency resource deployment.

Plant Cultivation for Childhood Stress Reduction in Crises: Enhancing Efficacy via AI

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Systematic reviews and meta-analyses validate horticultural therapy—plant cultivation—as an evidence-based intervention mitigating pediatric stress during crises (e.g., pandemics, academic/family stress).

Plant interaction significantly reduces cortisol levels, enhances parasympathetic activity, and fosters calmness, responsibility, life-cycle connection, focused attention, and emotional regulation. To maximize efficacy for digitally native cohorts, technological innovation is imperative. Artificial Intelligence (AI) offers transformative potential through:

1. Personalized Guidance: Machine learning algorithms analyze age, developmental stage, interests, and biometric stress indicators (e.g., heart rate variability, sleep patterns) to recommend optimal plant species, tailored care protocols, and scaffolded challenges. NLP-driven chatbots provide instant, developmentally appropriate support.
2. Gamified Engagement: AI-powered AR/VR simulates interactive plant/ecosystem dynamics. Serious games employing behavioral activation principles and reward-based narratives sustain intrinsic motivation and knowledge retention.
3. Intelligent Monitoring: Computer vision (e.g., CNN-based image analysis) assesses plant health, enabling predictive diagnostics. Affective computing analyzes multimodal cues (facial electromyography, vocal prosody) with explicit consent/privacy safeguards to quantify stress/engagement, enabling real-time adaptive feedback.
4. Secure Community: Federated learning platforms create moderated, GDPR-compliant environments for progress sharing, peer mentorship, and collaborative knowledge construction, mitigating isolation.

This synergy transforms horticultural therapy into a scalable, precision intervention. Integrating AI-driven personalization, immersive pedagogy, predictive analytics, and ethical community building significantly amplifies therapeutic outcomes, promoting resilience and digital-age mental well-being in children.

GRAPHCSVAE: Graph Categorical Structured Variational Autoencoder for Spatiotemporal Auditing of Physical Vulnerability Towards Sustainable Post-Disaster Risk Reduction

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In the aftermath of disasters, many institutions worldwide face challenges in continually monitoring changes in disaster risk, limiting the ability of key decision-makers to assess progress towards the UN Sendai Framework for Disaster Risk Reduction 2015–2030. While numerous efforts have substantially advanced the large-scale modeling of hazard and exposure through Earth observation and data-driven methods, progress remains limited in modeling another equally important yet challenging element of the risk equation: physical vulnerability. To address this gap, we introduce Graph Categorical Structured Variational Autoencoder (GRAPHCSVAE), a novel probabilistic data-driven framework for modeling physical vulnerability by integrating deep learning, graph representation, and categorical probabilistic inference, using time-series satellite-derived datasets and prior expert belief systems. We introduce a weakly supervised first-order transition matrix that reflects the changes in the spatiotemporal distribution of physical vulnerability in two disaster-stricken and socioeconomically disadvantaged areas: (1) the cyclone-impacted coastal Khurushkul community in Bangladesh and (2) the mudslide-affected city of Freetown in Sierra Leone. Our work reveals post-disaster regional dynamics in physical vulnerability, offering valuable insights into localized spatiotemporal auditing and sustainable strategies for post-disaster risk reduction. The data and code are respectively available at https://doi.org/10.5281/zenodo.16656471 and https://github.com/riskaudit/GraphCSVAE.

Keywords: Weakly supervised, graph deep learning, categorical distribution, physical vulnerability, remote sensing, spatiotemporal disaster risk, transition matrix

PAPERS ABSTRACT

Investigation of Indigenous Community Participation in Enhancing Urban Flood Resilience (Flood on 28th July 2022 Imamzadeh Davood, Tehran-Iran)

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Climate change has intensified urban flooding in Tehran, particularly in slum areas, causing significant damage. Current flood management in Iran often prioritizes technical solutions, such as concrete barriers, while overlooking local knowledge, like traditional water management or people's social participation. This study proposes a framework to integrate local community knowledge into urban planning for equitable flood resilience, drawing on social resilience and social-ecological systems (SES) frameworks. Through qualitative methods—semi-structured interviews with Imamzadeh Davood local residents, co-creation workshops with stakeholders, and analysis of policy documents—this research examines how local practices and social participation can complement engineering approaches. Findings from the case of Imamzadeh Davood show that relocating structures at risk with the awareness of local people, transferring the benefits of stakeholders to safer areas, and re-urbanizing while maintaining distance from the riverbank can increase urban flood resilience. Co-creation workshops in Tehran have revealed trust between communities and institutions as a critical barrier, often due to insufficient policy support for collaboration. This study provides practical guidelines for urban planners to design sustainable, inclusive flood management strategies that center local voices. It highlights the need for policies that foster institutional-community partnerships to improve flood management effectiveness in Tehran.

Keywords: Urban Resilience, Local Knowledge, Community Participation, Flood Management, Imamzadeh Davood, Tehran

Fostering collaboration, cooperation and interoperability in training for crisis and disaster scenarios

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Fostering collaboration, cooperation andinteroperability through training and exercises has recently been addressed in various frameworks, including the Sendai Framework for Disaster Risk Reduction 2015 – 2030. Nevertheless, implementation guidelines by UNDRR, WHO or PAHO mainly present traditional formats of exercises without focusing on this issue while research is only slowly approaching the topic.

To address this gap, the paper first presents general considerations for planning and conducting training and exercises to establish a basis for the focused review conducted to identify enablers for collaboration, cooperation and interoperability. The studies included in the review present research from the fields of civil protection and industrial safety. Factors fostering collaboration, cooperation and interoperability have been deduced from the examples and discussions therein.

Based on the review, identified enablers include specific goals regarding collaboration, cooperation and interoperability, providing spaces and means for interaction, conducting debriefings, repetition of the scenario and fostering trust, communication and permanent collaboration. As the reviewed studies mostly do not focus on the specific enablers, they lack random control trials and indicators of the factors' additional value. This should be addressed by future research with study designs that compare the suitability and effectiveness of using fostering factors in different methods as well as comparisons to non-specific trainings.

Keywords: Disaster preparedness, emergency response exercise, novel training methods, simulation training, civil protection, industrial safety, collaboration, cooperation, interoperability, focused review, IDRC 2025

Next-Generation Emergency Communication Systems: Design and Evaluation of the e112 Mobile Application Platform

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This paper presents e112, a context-aware mobile emergency response application, designed to strengthen communication between citizens and authorities during disasters. Building on the ubiquity of smartphones, the system provides SOS requests, incident reporting, customized alerts, evacuation guidance, and moderated community interaction, supported by a cloud-based back end and an operator dashboard for situational awareness. A user-centered design approach guided our development, ensuring clarity and usability under stressful conditions. Evaluation through usability studies and technical audits demonstrated high user satisfaction, robust performance, and accessibility. The results show that a simple, well-designed mobile application can significantly enhance emergency preparedness and response, reducing risks to human life during climate change–driven emergencies.

Keywords: Emergency response systems, Mobile applications, Cloud micro-services, Disaster management

Disaster evacuation of the old city of Nicosia

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Historic urban centers face unique evacuation challenges due to their dense morphology, aging infrastructure, and cultural preservation constraints. This study focuses on Nicosia's walled Old Town, a complex environment shaped by 16th-century fortifications, irregular street patterns, and limited access through six operational gates. Using a high-fidelity, geo-referenced digital twin of the area, we simulate evacuation scenarios under various stress conditions, including road closures, gate blockages, and alternative shelter placements, through a hybrid agent-based model built in Unity. Our findings reveal that certain conditions lead to significant evacuation delays, and that uncoordinated infrastructure additions may worsen outcomes without proper guidance mechanisms. This work highlights the importance of coupling infrastructure upgrades with adaptive flow-management strategies and provides an open-source dataset to support future research in disaster risk reduction and crowd dynamics in historic cities.

Keywords: Crowd simulation, Vehicle evacuation, Urban areas, Disaster evacuation

PAPERS ABSTRACT

Net Zero: Heritage for Climate Action and READY

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The Global Assessment Report on Disaster Risk Reduction 2025 (GAR 2025) highlights that the accelerating pace and interconnection of climate, environmental, and human-made crises are producing escalating losses and damages, with the annual global cost of disasters now exceeding USD 2 trillion. These complex, overlapping hazard events—spanning extreme weather, conflict, and systemic shocks—threaten not only lives and livelihoods but also the tangible and intangible heritage that sustains livelihoods, social cohesion, and the collective memory of associated communities.

In this context, ICCROM–First Aid and Resilience for Cultural Heritage in Times of Crisis (FAR) programme's Net Zero: Heritage for Climate Action and READY – Safeguarding Cultural Heritage from Disasters, Extreme Weather Events and Complex Emergencies offer complementary, community-centred capacity development models for integrating cultural heritage safeguard into disaster risk management, climate action, and peacebuilding.

The two initiatives are closely interconnected and mutually reinforcing. Net Zero: Heritage for Climate Action focuses on understanding climate-related risks to heritage and developing integrated solutions that link heritage safeguard, disaster risk management, and climate action. It draws on the lived experiences and traditional knowledge of local communities to co-create context-specific strategies. The capacity development particularly targets marginalized communities whose livelihoods depend on natural resources.
Dovetailing into this action is READY – Safeguarding Cultural Heritage from Disasters, Extreme Weather Events and Complex Emergencies, which mainstreams the climate risk assessment developed as part of Net Zero and further field-tests and contextualizes it to archives, libraries, and museums. It institutionalizes this process and expands the scope to a comprehensive disaster risk management framework—addressing not only climate-related risks but also integrating conflicts and disasters. It explores how climate acts as a risk driver for conflicts and disasters, and how community risk perceptions help heritage institutions and sites develop strategies that reduce risks to heritage while strengthening community engagement and resilience.

Both initiatives examine the intersection of intangible and tangible heritage in the context of disaster risk management, climate action, and peacebuilding—one from the ground realities and the other from institutional perspectives. Together, they create a continuum of action connecting heritage safeguarding with broader resilience-building and risk reduction strategies.

Case studies from India, Brazil, Sudan, Uganda, and across Europe (Armenia, Germany, Estonia, among others) illustrate how heritage-based actions—from community flood management and early warning systems to climate-sensitive restoration and emergency response planning—can simultaneously reduce risks, strengthen adaptive capacities, and foster social cohesion.

This paper will showcase the integrated and comprehensive approach adopted by ICCROM-FAR through these initiatives, illustrating how culture-based solutions reduce disaster risk, strengthen adaptive capacity, and foster social cohesion.

AXOLOTL: An ERA-5 Driven Framework for the Joint Detection of Tropical-Cyclone Centers and Intensities.

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Hurricanes rank among the most destructive natural phenomena, and accurately predicting their tracks and intensities is essential for issuing early warnings. Recent advances in data-driven weather forecasting (e.g., GraphCast and Pangu-Weather) have shown that deep learning can match—or even surpass—traditional numerical weather prediction in both speed and

accuracy. Building on this progress, we propose AXOLOTL,anewmodulespecificallydesignedfortropical-cyclone(hurricane) forecasting within the end-to-end Aardvark prediction architecture, a model with proven efficiency in weather prediction. AXOLOTL leverages Aardvark's global weather forecasts alongside additional storm-specific data to produce dedicated hurricane forecasts. The module has already achieved promising improvements in capturing location and formation, with the potential to identify rapid intensification. By generating forecasts almost instantaneously, AXOLOTL reduces operational and technical costs, benefiting regions with economic and technological constraints. This architecture proves deployable and replicable.

Keywords: Hurricane forecasting, artificial intelligence, deep learning, weather prediction, tropical cyclones

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Governance Gaps in Arctic Disaster Risk Assessment: A Comparative Policy Analysis of AI and State Institutions (Wildfires, Oil Spills, Seismic Events)

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The accelerating pace of climate change, industrial expansion, and extreme events in the Arctic has exposed persistent governance gaps in disaster risk assessment. This study conducts a comparative policy analysis of official Russian Ministry of Emergency Situations (EMERCOM) reports and AI-generated scenarios for three major Arctic disasters: the 2024 Sakha Republic wildfire, the 2020 Norilsk oil spill, and the 2025 Kamchatka earthquake.

Using adaptive governance theory, the cascading risk paradigm, and the DPSIR framework, we evaluate eight criteria across cases, including disaster extent, economic and social impacts, policy gaps. And future risks. Findings show that AI models consistently capture indirect and long-term consequences – such as health impacts, Indigenous community displacement, and systemic infrastructure vulnerabilities – largely absent from official accounts. While AI demonstrated value in identifying low-probability, high-impact cascading risks, it also misjudged spatial and temporal parameters due to limited Arctic-specific training data and difficulty modelling human institutional behaviour. The analysis underscored the potential of hybrid risk governance approaches that integrate AI foresight with institutional expertise, Indigenous knowledge, and participatory validation.

Policy recommendations include embedding AI-assisted scenarios modelling within EMERCOM's protocols, adopting integrated foresight frameworks, and enhancing transparency through public-facing comparative risk dashboards. By systematically contrasting state and AI disaster narratives, this study highlights both the opportunities and constraints of algorithmic forecasting in closing governance gaps under conditions of Arctic uncertainty.

Keywords: Arctic risk governance, AI scenario modeling, Indigenous disaster resilience, IDRC 2025

Civil Society and AI-Enhanced Disaster Resilience in East Asia: Comparative Insights from China, Japan, and Korea

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Civil society organizations (CSOs) play a critical role in disaster governance, but their effectiveness is conditioned by the openness of governance systems and the integration of emerging technologies. This study applies a comparative case analysis of three East Asian countries—China, Japan, and Korea—that share advanced infrastructures and exposure to similar hazards yet differ in state–society relations. Using the 2021 Henan floods, the 2024 Noto earthquake, and the 2022 Seoul floods as cases, the study develops a co-production space framework to assess how governance openness and intermediary capacity shape

resilience outcomes. The findings highlight distinct trajectories: China's digitally driven mobilization enabled rapid scale but was constrained by "graduated control"; Japan institutionalized equitable volunteer engagement through robust intermediary networks; and Korea's platform-centered model achieved metropolitan efficiency while weakening last-mile inclusion. The analysis shows that governance openness amplifies technological benefits, intermediary organizations anchor legitimacy and coordination, and equity must be embedded at the design stage. By mapping these dynamics, the study advances a comparative repertoire of resilience pathways with broader relevance for disaster risk reduction beyond East Asia.

Keywords: Civil society organizations, emerging technologies, disaster resilience, co-production

Innovation Ecosystem for Disaster Risk Reduction through Platform Economy

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Climate change and disasters are causing unprecedented, complex, and cascading challenges. The disaster risk reduction (DRR) community is putting tremendous efforts to intervene and innovate, but much more effort is required to cope up with the increasing pace of climate change and disasters. This research paper presents the potential of a Platform Economy business model for creating an Innovation Ecosystem for DRR. The research triangulates three domains – trends among existing innovation initiatives for DRR, Technology Readiness Level that outline innovation life cycle, and a Platform Economy business model which has led to the successes of organizations like Amazon, Apple, Google, etc. The Platform Economy business model creates a 'platform with ecosystem' for free interactions among consumers and solution providers revolutionizing the pace of innovation, testing, adoption, and often unlocks new paradigms of innovation.

The research methodology consists of analyses of thirty innovation initiatives in DRR space to identify key stakeholders, their roles and value propositions. These trends are mapped to the Technology Readiness Levels to identify levers to conceptualize a platform economy based innovation ecosystem for the global DRR community.
This study demonstrates that Platform Economy model can create an innovation ecosystem for the DRR community enabling them to connect and support each other by exchanging knowledge, services, products, and capacity. Such an ecosystem can transform innovations, make them accessible, and mainstream globally.

Keywords: Innovation ecosystem, DRR community, Platform economy, Technology Readiness Level, IDRC 2025

Deep leaning to estimate catastrophic health spending risks in disaster-affected, data scarce settings

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Disasters can increase out-of-pocket health spending and push vulnerable households into poverty. Mitigation measures require understanding changes to household health spending patterns caused by the disaster. Yet in many disaster-affected low- and middle-income countries, pre-disaster health spending data are often missing, limiting assessment of disaster impacts and design of protective policies. In this paper we develop and apply a deep learning approach to estimate pre-disaster household health expenditures. Using longitudinal survey data from Indonesia that capture a quasi-natural experiment around the 2006 Yogyakarta earthquake, we first develop a Feedforward Neural Network model that learns patterns in household health spending across income, hazard intensity, and other characteristics. The model predicts fairly, with accuracy above 70% in a noisy and complex domain using structured data. Adding some confidence to our predictions is that the difference between actual and predicted values is not statistically significant at the 1% level. The model is then applied to survey data collected in the aftermath of the 2004 Indian Ocean tsunami, to estimate pre-tsunami health spending. The predictions match external national benchmarks. This is then used to show that without targeted aid received directly by

households, catastrophic health spending would have increased to 19% on average from baseline levels of 7%. This demonstrates the potential of artificial intelligence to recover unrecorded health spending baselines in data-scarce disaster settings, offering a new tool to inform equitable disaster preparedness, health financing, and poverty prevention strategies worldwide.

Standards for Digital Risk Mitigation in Urban Disaster Resilience: A Case Study of Flood-Resilient Cities

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Urban areas worldwide are increasingly vulnerable to flooding due to climate change, rapid urbanization, and aging infrastructure. Digital technologies, particularly Digital Twins (DTs) and real-time monitoring systems, offer promising solutions for mitigating urban flood risks. This paper examines how standards for digital risk mitigation enhance urban flood resilience, with a focus on a practical implementation in Gorakhpur, India, and comparative references to flood events in Iran. The findings highlight that digital technologies improve emergency response times, reduce infrastructure damage, and facilitate more informed decision-making during flood events.

Keywords: Resiliency, Digital Risk, Mitigation, Disaster, Flood

From Data to Decisions - An XR Platform for Crisis Communication and Situational Awareness

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The C.A.R.E. XR project is made to improve how people communicate and understand the situation during crisis. Many times, information in emergencies is not clear, comes in different languages, or is too much for people to handle. C.A.R.E. XR uses three main technologies to solve this: better communication with AI, 3D reconstruction of places, and data from IoT sensors.

For communication, the system uses AI tools for transcription and summarization. This means that when people speak, the system can write it down immediately, even if the environment is loud or stressful. Later, the system can make short summaries, so leaders do not need to read long texts but can see only the most important points. There is also automatic translation, so people from different countries can work together and understand each other without problem.

Another important part is 3D reconstruction. With methods like photogrammetry and Gaussian Splatting, C.A.R.E. XR can quickly build realistic models of terrain, buildings, or damaged areas. This gives responders the chance to see the environment in 3D before they enter. For training, these models give very real examples to practice on. For real operations, they help responders plan where to go, what is dangerous, and how to use their resources better.

The project also connects IoT devices directly to the XR platform. Sensors in the field can send information about temperature, gas, movement, or live video. This data is shown inside the 3D maps and models, so people can see what is happening in real time. For example, a responder wearing a headset can see sensor values or warning zones directly on the building they are looking at. This makes decisions faster and safer.

Together, these three parts: communication with AI, 3D reconstruction, and IoT integration, give one complete picture of the crisis. C.A.R.E. XR does not just collect information, it organizes it in a way that people can use immediately, so they can act with more confidence and less risk.

Keywords: Civil society organizations, emerging technologies, disaster resilience, co-production

PAPERS ABSTRACT

Is Waste Blocking Our Cities? AMultisource Approach to Understanding Flood Disruption in Nairobi

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Urban flooding in cities of the Global South is often intensified by infrastructural gaps. This study examines the 2024 flood in Nairobi, using Meta's mobility data, flood simulation outputs, and AI based detection of illegal dumping from street imagery. Results reveal that over 75% of detected waste sites are within 500 meters of informal settlements, which also experienced significant population displacement not captured by conventional flood models. By highlighting the spatial overlap between unmanagedwaste andun-modelled disruption, the research calls for integrating socio-material factors into urban flood risk assessments to better reflect lived vulnerabilities.

Keywords: Urban flood risk, population count data, street view imagery, remote sensing, environmental inequality, Nairobi

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Self-Reflection Paper: Knowledge Hierarchies and Power Imbalances in Post-Disaster Humanitarian Response

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The academic research of the Global North has profoundly shaped the theoretical frameworks and knowledge systems in humanitarianism and disaster risk reduction (DRR). This research dominance has simultaneously produced knowledge hierarchies, privileging certain knowledge and practices while marginalising others.

Drawing from my Ph.D. fieldwork in the Philippines, this paper offers a self-reflective analysis of the researcher's positionality within the data collection and analysis process. Under the interpretivist paradigm of my Ph.D. research, the epistemic imbalance among the triad of institution–researcher–community becomes particularly vulnerable due to such 'academic privilege'. The privilege embedded in Global North frameworks can easily lead to community members being treated as data sources rather than as valuable partners in knowledge production. Failure to acknowledge indigenous contributions may weaken data quality, furthermore, it may contaminate the data and ultimately undermine the research outcome. By using the empirical evidence from the fieldwork in the Philippines, this paper critically argued the power imbalance behind the research dynamic: the existed research template and academic privilege misalign research relationships, and inspiring to contribute a reflexive language aware protocol for partnering with communities in DRR and Humanitarianism research.

Keywords: Reflexivity in Research Epistemic Justice, Colonisation, Knowledge Hierarchies, Disaster Risk Reduction, IDRC 2025

P-Wave Detection for Earthquake Early Warning: Optimizing Existing Accelerometer Networks

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In seismically vulnerable regions such as Iran and Turkey, extensive networks of accelerometers and seismographs are in place. The early detection of P-waves enables the immediate alerting of the population and the timely safeguarding of critical infrastructures.

In contrast to conventional systems that rely on the combined detection of P- and S-waves, this approach allows for significantly shorter response times.

The Japanese Shinkansen system, which has employed P-wave-based early warning (UrEDAS) since 1992,

demonstrates the potential for reducing damage and injuries.
Experiences such as the earthquake in Myanmar in March 2025, whose effects were felt as far as Bangkok, further underline the importance of cross-border networks of P-Wave based early Warning Systems.

In addition to strategic planning and the development of technical infrastructures, enhanced risk communication as well as inter-organizational coordination and cooperation are of central importance.

These factors are crucial for enabling a shared situational picture in real time.

The aforementioned activities contribute to limiting human and financial losses and to strengthening resilience in a sustainable manner.

Keywords: Strategic planning, risk communication, inter-organizational coordination, early warning system, seismic networks

Mapping peripheries urban disaster risk in Brazil and structural interventions

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The Municipal Plan for Risk Reduction (PMRR) are important instruments that support the decision-making process for allocating resources from the Federal Government of Brazil to implement structural interventions, such as slope stabilization and urban drainage works, under the New Growth Acceleration Program (Novo Programa de Aceleração do Crescimento - Novo PAC). The PMRR presents the mapping of hydrological and mass movement risk of disasters areas in urban peripheries.

As an example, we can mention the municipality of Contagem/MG, which uses Geographic Information System (GIS) technologies and field work to prepare its PMRR, and has been selected to receive slope retaining wall and stabilization under the Novo PAC Program.

PUBLICATION OPPORTUNITIES

Selected high-quality papers presented at IDRC 2025 will be considered for publication in reputable international journals, including:

International Journal of Disaster Risk Management

– Progress in Disaster Science

– All submissions will undergo a peer-review process in collaboration with the journals' editorial boards.

SPECIAL THANKS

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